AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1(Currently amending): A method of ~~determination~~ determining ~~of~~ a property of an optical device under test, the method comprising:

using a first initial coherent light beam~~,~~ ;

changing a first initial property of the first initial coherent light beam~~,~~ ;

coupling the first initial coherent light beam to the device under test~~,~~ ;

detecting a first signal of the first initial coherent light beam received from the device under test~~,~~ ; and

correcting a non-linearity in the first signal, the non-linearity being caused by a non-linearity in ~~the~~ a change of the first initial property by interpolating the first signal on a linear scale.

Claim 2(Currently amending): The method of claim 1, further comprising:

using a second initial coherent light beam~~,~~ ;

changing a second initial property of the second initial coherent light beam~~,~~ ;

detecting a second signal of the second initial coherent light beam, without coupling ~~it~~ the second initial coherent light beam to the device under test~~,~~ to discover a non-linearity in the second signal caused by a non-linearity in ~~the~~ a change of the second initial property~~,~~ ; and

using the discovered non-linearity of the detected second signal to interpolate the first signal.

Claim 3 (Currently amending): The method of claim ~~1~~ 2, further comprising:

producing a coherent light beam~~,~~ ; and

splitting the coherent light beam into a first initial light beam and a second initial light beam~~.~~.

Claim 4 (Currently amending): The method of claim 1, further comprising detecting the first signal ~~resulting property~~ substantially simultaneously with the second signal ~~resulting property~~.

Claim 5(Currently amending): The method of claim ~~1~~ 2, further comprising changing the first initial property substantially simultaneously with the second initial property.

Claim 6 (Currently amending): The method of claim ~~1~~ 2, wherein the first initial property and the second initial property are substantially the same initial property.

Claim 7 (Currently amending): The method of claim 1, wherein the first initial property is ~~the~~ a frequency of the coherent light beam.

Claim 8 (Currently amending): The method of claim ~~1~~ 7, further comprising the steps of:

transforming the first signal in a ~~number~~ plurality of phase signals over a linear scale of a ~~number~~ plurality of points of time~~,~~ ;

transforming the second signal in a ~~number~~ plurality of frequency signals over the plurality of points of time, the plurality of points of time being ~~same~~ a plurality of linear scale of points of time to discover a non-linearity in the second signal, said non-linearity caused by a non-linearity in ~~the~~ a change of the initial property, the initial property being the frequency of the coherent light~~,~~ ;

assigning the transformed first signal to the transformed second signal~~,~~ ; and

interpolating the assigned transformed first signal on a linear scale of

frequencies.

Claim 9 (Currently amending): The method of claim 8, further comprising creating the linear scale of frequencies $f_{lin}(n)$ according to the formula

$f_{lin}(n) = (f_{min} - f_{max}) \times (n/N)$, n Element 1,..., N, wherein N ~~being~~ is the ~~number~~ plurality of points of time.

Claim 10 (Currently amending): The method of claim 1, further comprising:

splitting the first initial coherent light beam into a first light beam and a second light beam~~,~~ ;

coupling the first light beam to the optical device under test~~,~~ ;

letting the second light beam travel to a different path relative to ~~as~~ the first light beam~~,~~ ;

superimposing the first and the second light beam to produce interference, the interference being between the first light beam and the second light beam, the interference producing ~~in~~ a resulting first superimposed light beam~~,~~ ;

detecting as a first signal ~~the~~ a power of the first superimposed light beam as a function of time when tuning ~~the~~ a frequency of the coherent light beam from a minimum to a maximum of a ~~given~~ predetermined frequency range in a ~~given~~ predetermined time interval~~,~~ ;

splitting the second initial light beam in a third light beam and a fourth light beam~~,~~ ;

superimposing the third light beam and the fourth light beam after each of the third and fourth light ~~beam has~~ beams have each traveled a different path, ~~to~~ the third light beam and the fourth light beam ~~produce~~ producing interference between the third and the fourth light beam in a resulting second superimposed light beam~~,~~ ;

detecting as a second signal ~~the~~ a power of the resulting second superimposed light beam as a function of time when tuning the frequency of the

coherent light beam from a maximum to a minimum of a ~~given~~ predetermined frequency range in a ~~given~~ predetermined time interval~~,~~ ;

using the detected second signal for deriving a non-linearity information about a non-linearity in a tuning gradient of the frequency when tuning the frequency of the coherent light beam from the maximum to the minimum of the ~~given~~ predetermined frequency range~~,~~ ; and

using the non-linearity information for correcting an effect ~~effects~~ on the first signal caused by the non-linearity to ~~get~~ obtain a corrected first signal.

Claim 11 (Currently amending): The method of claim ~~1~~ 8, further comprising deriving the non-linearity information by:

transforming the second signal to ~~get~~ obtain a Fourier transformed second signal~~,~~ ;

eliminating ~~the~~ a plurality of negative parts of the Fourier transformed second signal to ~~get~~ obtain a non-negative Fourier transformed second signal~~,~~ ;

retransforming the non-negative Fourier transformed second signal to ~~get~~ obtain an analytic signal of the second signal~~,~~ ;

determining ~~the~~ a phase of the analytic signal to ~~get~~ obtain as a second phase signal the phase as a function of time of the second signal~~,~~ ; and

using the second phase signal for determining as the non-linearity information the frequency as a function of time of the second signal.

Claim 12 (Currently amending): The method of claim ~~1~~ 7, further comprising deriving a first phase signal by:

transforming the first signal to ~~get~~ obtain a Fourier transformed first signal~~,~~ ;

eliminating the plurality of negative parts of the Fourier transformed first signal to ~~get~~ obtain a non-negative Fourier transformed first signal~~,~~ ;

retransforming the non-negative Fourier transformed first signal to ~~get~~ obtain an analytic signal of the first signal~~,~~ ; and

determining the phase of the analytic signal to ~~get~~ obtain as a first phase signal as a function of time of the first signal.

Claim 13 (Currently amending): The method of claim ~~1~~ 12, further comprising correcting ~~the~~ effects on the first signal caused by the non-linearity by using the non-linearity information to interpolate the first phase signal of the first signal on a linear scale of frequencies to ~~get~~ obtain a corrected first phase signal.

Claim 14 (Currently amending): The method of claim ~~1~~ 11, further comprising determining the frequency f(n) of the second signal as a function of n discrete points of time, wherein n= 1, ..., N, on the basis of the second phase signal to determine the non-linearity information by:

determining the second phase signal $\phi(n)$ at the n points of time~~,~~ ;

determining ~~the~~ a maximum ϕ_{max} of the second phase signal~~,~~ ; and

using a predetermined maximum frequency f_{max} of the frequency range, a predetermined average tuning velocity during tuning the frequency and the maximum ϕ_{max} of the second phase signal to determine for each of the n points of time the frequency f(n) according to the formula: $f(n)=[(f_{max}-f_{min})/\phi_{max}]\phi(n)$.

Claim 15 (Currently amending): The method of claim ~~1~~ 13, further comprising ~~getting~~ obtaining the linear scale $f_{lin}(n)$ of frequencies by:

using the predetermined maximum frequency f_{max} of the frequency range and the predetermined minimum frequency f_{min} of the frequency range to determine the linear scale $f_{lin}(n)$ of frequencies according to the formula: $f_{lin}(n)=[(f_{max}-f_{min})/(N-1)]n$~~,~~ ; and

sorting the absolute values of f(n) monotonically.

Claim 16 (Currently amending): The method of claim ~~1~~ 14, further comprising using f(n) for interpolating the first phase signal of the first signal on the linear scale of frequencies $f_{lin}(n)$.

Claim 17 (Currently amending): The method of claim 1, further comprising deriving a property being selected from the group consisting of a transmissive property, a reflective property, and any combinations thereof ~~transmissive and/or reflective properties~~ of the optical device under test from ~~the~~ a compensated first signal.

Claim 18 (Currently amending): The method of claim ~~1~~ 7, further comprising at least one of the following:

deriving a group delay of the optical device under test as a function of frequency from the corrected first signal~~,~~ ; and

deriving ~~the~~ a chromatic dispersion coefficient of the optical device under test as a function of frequency from ~~the~~ a corrected first signal.

Claim 19 (Currently amending): The method of claim ~~1~~ 13, further comprising deriving a group delay of the optical device under test by differentiating the corrected first phase signal with respect to the frequency.

Claim 20 (Currently amending): The method of claim ~~1~~ 13, further comprising ignoring at ~~the begin~~ a commencement of ~~the~~ a tuning a predetermined amount of values of the corrected first phase signal to eliminate a plurality of teething troubles ~~out of~~ from the corrected first signal.

Claim 21 (Currently amending): The method of claim ~~1~~ 19, further comprising:

approximating the group delay with ~~polynoms~~ a polynomial of at least second order to get an approximated group delay, and

subtracting the approximated group delay from the group delay to ~~get~~ obtain a non-linear part of the group delay.

Claim 22 (Currently amending): The method of claim ~~1~~ 21, further comprising using the non-linear part of the group delay to determine ~~the~~ a mean signal power of a deviation from a linear group delay of the device under test.

Claim 23 (Currently amending): The method of claim ~~1~~ 22, further comprising using ~~the square coefficient~~ a square coefficient of the polynomial to determine ~~the~~ a mean gradient of the group delay.

Claim 24 (Currently amending): The method of claim 1, further comprising making the first signal oscillating about a zero line by:

determining ~~the~~ a plurality of points of mean value of the first signal~~,~~ ;

interpolating a curve through ~~these points~~ said plurality of points of mean value of the first signal; and

subtracting ~~the values~~ plurality of points of mean value of the curve from the first signal to ~~get~~ obtain a corrected first signal oscillating about the zero line.

Claim 25 (Currently amending): The method of claim ~~1~~ 24, further comprising determining the points of mean value by extracting ~~all~~ points ~~with~~ having a maximum gradient.

Claim 26 (Currently amending): The method of claim ~~1~~ 24, further comprising making the first signal oscillating about a zero line by determining the plurality of points of mean value of the first signal by:

(a) determining ~~the~~ a maximum and ~~the~~ a minimum of the first signal in a predetermined first range of time, the predetermined first range of time being less ~~smaller~~ than ~~the~~ a total range of time~~,~~ ;

(b) determining a mean value between the maximum and the minimum~~,~~ ;

(c) determining the maximum and the minimum of the first signal in a predetermined ~~next~~ second range of time being adjacent the ~~already~~ examined predetermined first range of time~~,~~ ;

(d) determining a mean value between the maximum and the minimum~~,~~ ;

and

(e) repeating ~~the last two~~ steps (c) and (d) until the ~~complete~~ total range of time ~~interval~~ is covered.

Claim 27 (Currently amending): The method of claim ~~1~~ 26, further comprising ~~choosing~~ the step of selecting the predetermined first range of time by:

determining ~~the~~ an average period of the oscillations of the first signal~~,~~ ;and

choosing ~~the~~ a size of the range so that more than about two average periods fit in the chosen range of time.

Claim 28 (Currently amending): The method of claim ~~1~~ 12, further comprising determining the points of mean value by:

determining the maximum of the Fourier transformed signal of the first signal,

using the maximum to determine a size of a high-pass filter, and

filtering the Fourier transformed first signal with the high-pass filter.

Claim 29 (Currently amending): A method of ~~determination of~~ determining a property of an optical device under test~~,~~ comprising:

detecting a change of a signal with time, the detected signal being the basis for deriving the property~~,~~ ; and

filtering the detected signal by:

transforming the detected signal to get a Fourier transformed signal~~,~~ ;

filtering the Fourier transformed signal with a filter to ~~get~~ obtain a filtered Fourier transformed signal~~,~~ ;

retransforming the filtered Fourier transformed signal to ~~get~~ obtain a filtered signal~~,~~ ; and

deriving the property on the basis of the filtered signal.

Claim 30 (Currently amending): The method of claim 29, further comprising correcting the detected signal for a non-linearity to ~~get~~ obtain a corrected first signal by:

using a first initial coherent light beam~~,~~ ;

changing a first initial property of the first initial coherent light beam~~,~~ ;

coupling the first initial coherent light beam to the device under test~~,~~ ;

detecting a first signal of the first initial coherent light beam received from the device under test~~,~~ ; and

correcting a non-linearity in the first signal caused by a non-linearity in the change of the first initial property by interpolating the first signal on a linear scale.

Claim 31 (Currently amending): The method of claim ~~12~~ 13, further comprising:

using the corrected first signal to calculate the corrected first phase signal versus frequency~~,~~ ;

filtering the corrected first phase signal by Hilbert transforming ~~it~~ the corrected first phase signal before filtering ~~it~~ the corrected first phase signal to ~~get~~ obtain a corrected signal to be filtered by detecting a change of a signal with time, the corrected first signal being the basis for deriving the property~~,~~ ; and

filtering the detected signal by transforming the detected signal to ~~get~~ obtain a Fourier transformed signal~~,~~ ;

filtering the Fourier transformed signal with a filter to ~~get~~ obtain a filtered Fourier transformed signal~~,~~ ;

retransforming the filtered Fourier transformed signal to ~~get~~ obtain a filtered signal~~,~~ ; and deriving the property on the basis of the filtered signal.

Claim 32 (Currently amending): The method of claim ~~1~~ 19, further comprising filtering the corrected first signal before calculating the group delay.

Claim 33 (Currently amending): The method of claim ~~1~~ 32, further comprising adapting the filtering to the shape of the corrected first signal by:

making an interferometric signal, the interferometric signal being obtained from ~~out~~ ~~of~~ the corrected first phase signal~~,~~ ;

Fourier transforming the interferometric signal to ~~get~~ obtain a spectral signal~~,~~ ;

determining a fraction of ~~the~~ a maximum of the spectral signal~~,~~ ;

determining ~~the~~ an abscissas of ~~the~~ intersections of the ordinate of the fraction with the curve of the spectral signal~~,~~ ;

determining the mean frequency f_{mean} as the average of the abscissas~~,~~ ; and

band-pass filtering the spectral signal with a band-pass filter having ~~its~~ a center at the mean frequency and having a width greater than the width of the frequency range.

Claim 34 (Currently amending): The method of claim ~~1~~ 33, further comprising determining the width of the band-pass filter by:

predetermining or estimating ~~the~~ a maximal range GD_{range} of the group delay~~,~~ ;

determining the mean value GD_{mean} of the group delay by determining a fraction of the maximum of the spectral signal, determining the abscissas of the intersections of the ordinate of the fraction with the curve of the spectral signal~~,~~ ; and determining the mean frequency f_{mean} as the average of the abscissas~~,~~ ; and

calculating the filter width according to the formula: filter width= $f_{mean}(GD_{range}/GD_{mean})$.

Claim 35 (Currently amending): The method of claim ~~1~~ 34, further comprising:

subtracting a gradient in the group delay from the group delay~~,~~ ;

predetermining the maximum range GD_{range} of the group delay~~,~~ ;

determining the mean value GD_{mean} of the group delay by determining a fraction of the maximum of the spectral signal, determining the abscissas of the

intersections of the ordinate of the fraction with the curve of the spectral signal~~,~~ ; and determining the mean frequency f_{mean} as the average of the abscissas~~,~~ ;

calculating the filter width according to the formula: filter width= $f_{mean}(GD_{range}/GD_{mean})$,

calculating the group delay~~,~~ ; and

adding the subtracted gradient to the calculated group delay.

Claim 36 (Currently amending): A software program or product for executing a method for determining a property of an optical device under test, when run on a data processing system, ~~said~~ the method comprising:

program instructions for using a first initial coherent light beam~~,~~;

program instructions for changing a first initial property of the first initial coherent light beam~~,~~;

coupling the first initial coherent light beam to the device under test,

program instructions for detecting a first signal of the first initial coherent light beam received from the device under test~~,~~; and

program instructions for correcting a non-linearity in the first signal caused by a non-linearity in ~~the~~ a change of the first initial property by interpolating the first signal on a linear scale.

Claim 37 through 40 (Withdrawn).

Claim 41 (New): An apparatus for determining properties of an optical device under test, the apparatus comprising:

a first beam splitter, said first beam splitter being in a path of a coherent light beam, said first beam splitter for splitting said coherent light beam to a first initial light beam traveling a first initial path and to a second initial light beam traveling a second initial path;

a second beam splitter, said second beam splitter being in said first initial path, said second beam splitter for splitting said first initial light beam into a first light beam, said first light beam traveling a first path, and said second beam splitter splitting said first initial light beam into a second light beam, said second light beam traveling a second path, said first path has a predetermined place in said first path for coupling said first light beam to the optical device under test;

a third beam splitter, said third beam splitter being in said first and second path, said third beam splitter for superimposing said first and said second light beams after said second light beam has traveled a different path relative to said first light beam to produce an interference between said first light beam and said second light beam, said interference being in a resulting first superimposed light beam, said resulting first superimposed light beam traveling a first resulting path;

a first power detector, said first power detector for continuously detecting as a first signal a power of said first superimposed light beam as a function of time upon tuning a frequency of said coherent light beam from a minimum frequency to a maximum frequency of a predetermined frequency range in a predetermined time interval;

a fourth beam splitter, said fourth beam splitter for splitting said second initial beam in a third light beam traveling a third a path and a fourth light beam traveling a fourth path;

a fifth beam splitter being in said third and said fourth path, said fifth beam splitter for superimposing said third light beam and said fourth light beam after said third and said fourth light beam travel a predetermined second path, said predetermined second path producing a second interference between said third and said fourth light beam in a resulting second superimposed light beam, said resulting second superimposed light beam traveling a second resulting path;

a second power detector, said second power detector continuously detecting a second signal, said second signal being a power of said resulting second superimposed light beam as a function of time when tuning said frequency of said coherent light beam from said maximum frequency to said minimum frequency of said predetermined frequency range in said predetermined time interval; and

an evaluation unit, said evaluation unit deriving a plurality of optical properties of the optical device under test, said evaluation unit using said detected second signal for deriving an amount of non-linearity information about a non-linearity in a tuning gradient of said frequency when tuning said frequency of said coherent light beam from said maximum frequency to said minimum frequency of said predetermined frequency range, and for using said amount of non-linearity information for correcting an effect on said first signal, said effect being caused by said non-linearity to obtain a corrected first signal.